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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-------------------------------|------------------|
| 09/928,361 | 08/14/2001 | Hiroaki Takebe | 826.1741 | 6415 |
| 21171 | 7590 | 12/14/2004 | EXAMINER DASTOURI, MEHRDAD | |
| STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005 | | | ART UNIT 2623 | |
| PAPER NUMBER | | | | |

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 09/928,361 | Applicant(s) TAKEBE, HIROAKI | |
| | Examiner Mehrdad Dastouri | Art Unit 2623 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Lines 13-20 of Claim 1, "an expected value of a probability density function of the specific category is defined using normal distribution with an autocorrelation matrix of the set of difference vectors and the feature vector of the unknown pattern as a covariance matrix and an average, respectively, as a probability density function and the discriminant function is defined based on the expected value", is vague and indefinite.

Claim 3, in Lines 12-19; Claim 4, in Lines 13-20; Claim 5, in Lines 13-20; Claim 7, in Lines 15-22; Claim 8, in Lines 11-18; Claim 9, in Lines 9-16; Claim 10, in Lines 9-16; and Claim 11, in Lines 11-18 recite similar limitations, and are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

3. "an average feature vector of **each correct category**" recited in Claims 1, and 3-11, lack antecedent basis.
4. "the unknown pattern" recited in Lines 23-24 of Claim 7, lack antecedent basis.

Claim Objections

5. Claims 6, 7, and 10 are objected to because of the following informalities:

"a autocorrelation matrix" cited in Claims 6, 7 and 10, should be corrected to "an autocorrelation matrix".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2 and 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Lawrence et al., (hereinafter Lawrence), (Face Recognition Using Mixture-Distance and Raw Images, IEEE International Conference on Simulation).

Regarding Claim 1, Lawrence discloses a pattern recognition apparatus for recognizing a pattern based on value of probability density function defined for each category in a feature vector space of a pattern, comprising:

A calculation device calculating discriminant function of a specific category for a feature vector of an unknown pattern when a set of difference vectors is generated by calculating a difference (Page 2017, Column 1, Section 2, Vector **X**) between a feature vector of each pattern in a specific pattern set (Page 2017, Column 1, Section 2, Vector **T**) and an average feature vector of each correct category (Page 2017, Column 1, Section 2, The average face vector **A**), an expected value of a probability density function of the specific category is defined using normal distribution with an autocorrelation matrix of the set of difference vectors and the feature vector of the

unknown pattern as a covariance matrix and an average, respectively, as a probability density function and the discriminant function is defined based on the expected value (As best understood by the Examiner, Pages 2017-2018, Sections 2-4, Formulas (1)-(7); Model **G** Gaussian or normal model; co-variance matrices **C** and Σ_i); and

recognition device recognizing unknown pattern based on the value of the discriminant function and outputting a recognition result (Pages 2018-2021, Section 5).

Regarding Claim 2, Lawrence discloses the pattern recognition apparatus according to Claim 1, further comprising:

storage device storing both information about eigenvalues and eigenvectors of a covariance matrix of fluctuating distribution of the category and information about eigenvalues and eigenvectors of a covariance matrix of the normal distribution (Pages 2017-2018, Section 4),

wherein said calculation device calculates the value of the discriminant function using the information stored in the storage device (Pages 2017-2018, Section 4).

Regarding Claims 8-11, arguments analogous to those presented for Claim 1 are applicable to Claims 8-11.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 4, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lawrence et al., (hereinafter Lawrence), (Face Recognition Using Mixture-Distance and Raw Images, IEEE International Conference on Simulation) in view of Muller et al., (hereinafter Muller), (The Use of Eigenpictures for Optical Character Recognition; IEEE Paper on Proceedings of Fourteenth International Conference on Pattern Recognition).

With regards to Claim 4, arguments analogous to those presented for Claim 1 are applicable to Claim 4. The technique implemented by Lawrence is based on non-feature-based eigenfaces applied to faces as patterns to be recognized.

However, Muller discloses that the eigenface techniques can be easily extended to OCR problems for character recognition of specific fonts (Abstract, Sections 2-7).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lawrence's invention according to the teachings of Muller to apply the eigenface technique for character font recognition because this technique depends only on the fact that there is some correlation between the different images of the database, and the technique can be generalized to many other problems having the same characteristics (Muller, Section 1, Introduction).

Regarding Claims 4, 5 and 7, arguments analogous to those presented for Claim 3 are applicable to Claims 4 and 7. Regarding Claim 5, Claim language requires patterns with only one specific resolution which can be the image resolution depicted in Figure 1 of Muller Paper.

Allowable Subject Matter

10. Claim 6 would be allowable if rewritten to overcome 35 U.S.C. 112, second paragraph rejection, and the informalities set forth in the Office Action.

Other prior art cited

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,819,782 to Imagawa et al.;

U.S. Patent 5,794,178 to Caid et al.

NEC Research Institute Paper to Peter Yianilos, "Metric Learning via Normal Mixtures",

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mehrdad Dastouri
Primary Examiner
Art Unit 26234
December 11, 2004

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri